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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,385	12/20/2001	Alok Mani Srivastava	RD-29572	9712

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EXAMINER
GABOR, OTILIA

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 08/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/683,385	SRIVASTAVA ET AL.	
	Examiner	Art Unit	
	Otilia Gabor	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) *1-16 and 34-36* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-36* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *1* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

El ction/R strictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1-16, drawn to a method for determining past service conditions, classified in class 250, subclass 459.1.

   II. Claims 17-33, drawn to an apparatus for determining past service conditions, classified in class 250, subclass 458.1.

   III. Claims 34-36, drawn to a thermal barrier coating, classified in class 428, subclass 472.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus can be used to practice another process in which the crystalline phase is not determined. In the method claims, the crystalline phase must be determined to calculate one of the past service conditions or remaining useful life. The apparatus does not require that the crystalline phase be determined and therefore may practice a different process.

3. Inventions I and II are not related to Invention III. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04,

MPEP § 808.01). In the instant case the different inventions are not related because the article of Group III is not related to the method of Group I or the apparatus of Group II. Neither requires the thermal barrier coating to be zirconia that is required by the article claims.

4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Toan Vo on March 25, 2003 a provisional election was made with traverse to prosecute the invention of Group II, claims 17-33. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-16, 34-36 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Specification

6. The abstract of the disclosure is objected to because it also includes a description of the non-elected inventions. Correction is required. See MPEP § 608.01(b).

7. The disclosure is objected to because of the following informalities: the title of the invention includes a description of the non-elected inventions as well.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 17-23, 29, 30 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Choy et al. (WO 00/06796).

Choy et al. discloses an apparatus and method for inspecting the thermal barrier coating 10 of a turbine engine 30 and to determine a characteristic of it in order to monitor and predict its useful lifetime. The apparatus comprises:

- a laser source 50 to direct a first radiation 60 having a first wavelength onto the
- thermal barrier coating 10 which comprises a photoluminescing material of Eu, Tb or Dy doped yttria stabilized zirconia (claims 18, 19, 21, 22, 23) or yttrium aluminum oxide garnet (claim 18)
- a detector 100 to detect the second radiation 80 which has a second wavelength different than the wavelength of the first radiation 60 used to excite luminescence in the barrier coating 10, where the detector measures the intensity peaks (characteristic property of the coating 10) of the second emitted radiation for a given excitation wavelength
- an analyser 130 used to analyse the signal 120 from the detector 100 for spectral analysis whereby the intensity peaks of the second emitted radiation

(characteristic property) are related to the remaining useful lifetime of the coating of the engine or the past service conditions of the engine. See Fig.2. The laser source 50 emits a radiation with an excitation wavelength of 266 nm and the emission wavelength is in the range 580-640 nm. The two specific peaks depend on the excitation wavelength and composition of the coating. For the Eu doped coating composition the intensity peak analyzed is at about 615 nm (claim 29, see Fig.5). The useful time of the coating as well as the condition of the coating is determined by taking the ratio of intensities at two peaks and correlating it to intensities of peaks at known temperatures and time to engine failure (see Figs.4, 7,8, 10).

Since the detector captures the emitted radiation spectra it is inherent that it is a spectrophotometer (claim 30). The yttria present in the coating can be from 6-8 weight % of the barrier coating (see page 2, line 6).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 24-28, 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choy.

Regarding claims 24-27, 31-33 Choy fails to use UV radiation as the source radiation and visible light as the second emitted radiation, as well as he fails to use the specified peaks as claimed, however using different excitation radiation wavelengths would have been obvious to one of ordinary skill in the art since it is well known in the art that the excitation radiation wavelengths as well as the emission peak wavelengths depend on the composition of the sample material and on the circumstances present. Thus, it would have been obvious to one of ordinary skill in the art to use different excitation sources to obtain different emission peaks as well as to take the ratio at the relevant intensity peaks. These manipulations are obvious and well known in the field of spectroscopic measurement.

Regarding claims 28, 31 Choy does not use the amount of monoclinic crystalline phase of the coating as a condition to which the measured coating property is to be related to, however since he mentions measuring the phase changes, pressure, temperature and stress changes in the coating, it would have been obvious to one of ordinary skill in the art to include this crystalline phase measurement as well, since only

by relating the peak intensities to known amounts of crystalline phase can the phase change be measured. See page 10, lines 5-7.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Broicher et al. (U. S. Patent 5410154), Nissley et al. (U. S. Patent 5780171), Bowker et al. (U. S. Patent 6231998), Quick (U. S. Patent 5793042).

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Otilia Gabor whose telephone number is 703-305-0384. The examiner can normally be reached on Monday-Friday between 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 703-308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

CONSTANTINE HANNAHER
PRIMARY EXAMINER
GROUP ART UNIT 2878

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August 4, 2003